



# Educator Guide

Educational activities for the **June/July 2012** issue of *Xplor* magazine



## How Big is a Big Bug?

**“Bag a Big Bug” (Page 2)** invites students outdoors to see who can find the biggest bug. But how big is big? Measuring and recording skills are important—not just for science but for other subjects, too. This activity gives your students practice in using hand lenses, measuring length to the nearest millimeter, and making tables and graphs to record their data.

### Materials

- Science notebooks and pencils
- Plastic collection jars or vials
- Forceps or tweezers
- Insect nets
- Hand lenses or large magnifiers
- Metric rulers

### Procedure

1. Have students work individually or in small groups.
2. Instruct students to search the schoolyard for insects and other invertebrates and place them in collection jars.

3. After each student or group has collected several specimens, have all students bring



their finds to a central location for measuring and recording.

4. Have students place each insect on a metric ruler and measure the insect's body length to the nearest millimeter. In some cases, the collection jar or vial may be placed on the ruler and the specimen may be measured without removing it from the container. Hand lenses may help make the final determination.
5. Instruct students to record their data in their science notebooks. Information recorded should include type of insect or invertebrate and length of each specimen.

### Options

- Measurements may be organized in a data table and/or bar graph similar to the ones on Page 142 of the *Nature Unleashed* teacher guide.
- Specialized structures or certain body parts may or may not be included in measurement criteria. For example, antennae, legs or ovipositors may count in a specimen's length, or measurement may be restricted to the main body parts alone (head, thorax and abdomen).
- Measurements may focus on a certain specialized structure or body part alone. For example, who can find a katydid with the longest antennae?

**Caution:** Most insects and other invertebrates may be handled safely with bare hands, but others can bite or sting. Combine this activity with an identification exercise to increase your students' knowledge of local invertebrates and to teach them which ones to handle with caution.



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## Hello! My name is Mac Ro Invertebrate!

Solving the **“Riffle Riddle” (Page 16)** is a fun way to learn about stream macroinvertebrates and how their sensitivity to pollution can be used to indicate water quality. In the magazine, students identify pictures of stream macroinvertebrates. In this activity, students will identify the real things!

### Materials

- Science notebooks and pencils
- Aquatic nets or fine-meshed bait nets
- Kick seine or window screen
- Light-colored dishpans
- Plastic collection jars, vials or ice cube trays
- Forceps or tweezers
- Aquatic macroinvertebrate field guides
- Missouri Stream Team Blue Bug Card (from [mostreamteam.org](http://mostreamteam.org))

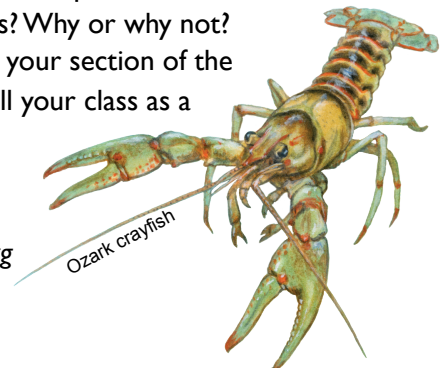
### Procedure

1. For background, have students read Page 38 of the *Nature Unleashed* student book.
2. Locate a local stream or river in which students can wade and collect aquatic invertebrates.
3. Divide students into groups of three or four and instruct how to use nets, seines or screens to collect invertebrates. Dump whatever they catch into dishpans for sorting (light-colored dishpans make specimens easier to see).
4. After each group has collected several specimens, have students use tweezers to carefully transfer specimens to plastic jars or ice cube trays for identification.
5. Use field guides or keys to identify specimens.

6. Instruct students to record their data in their notebooks. Information recorded should include date, stream name, location of collection area, type of invertebrate and number of each type.
7. Use the Missouri Stream Team Blue Bug Card as a key to determine the pollution sensitivity of each specimen.
8. Based on the pollution sensitivity of collected specimens, have students determine the water quality of the stream. Is it heavily polluted, somewhat polluted or not polluted?

### Options

- Visit [mostreamteam.org](http://mostreamteam.org) for a wealth of information about streams and their health. Especially useful for this activity are the Blue Bug Card and the Key to Macroinvertebrates found under the Stream Team Library tab at the top of the Web page.
- Student data may be organized in a data table and/or bar graph similar to the ones on Page 142 of the *Nature Unleashed* teacher guide.
- After your students learn about stream ecology, have them hypothesize about the reasons for their stream's water quality. What could students do to test their hypotheses?
- If possible, make several trips to sample invertebrates in different sections of the same stream. Are the same species found in different sections? Why or why not?
- As a class, adopt your section of the stream and enroll your class as a Missouri Stream Team. Find out how at [mostreamteam.org](http://mostreamteam.org)



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